Fragility, slow homogenization and Intermediate Phase in the \( \text{Si}_{x}\text{Ge}_{y}\text{Te}_{100-2x} \) ternary\(^1\) K. GUNASEKERA, P. BOOLCHAND, University of Cincinnati, S. MAMEDOV, Horiba Jobin Yvon Inc. — Small sized (0.5g) melts were synthesized by reacting pure elements in 5mm ID quartz tubes at 950°C, and examined after 1 week and then 2 weeks of reaction. Bulk glass formation is realized in 6%<\( x <16\% \) range with \( T_g(x) \) increasing linearly in 6%<\( x <12\% \) range, and decreasing thereafter (\( x >12\% \)). The enthalpy of relaxation at \( T_g \) shows a flat bottomed minimum in 7.5%<\( x <9.0\% \) range with the term increasing sharply at \( x >9\% \) and at \( x <7.5\% \). We identify the 7.5%<\( x <9.0\% \) range with the Intermediate Phase. Fragility(\( m \)) of melts were established in complex \( C_p \) measurements, and show a global minimum (\( m <30 \)) in the IP range, and a value of \( m =26 \) at \( x =8.5\% \). The slow homogenization of Telluride melts results from the strong character of IP melts. Raman scattering, excited using low power density of 785nm radiation, shows evidence of a broad mode near 160cm\(^{-1} \) (characteristic of \( \alpha \)-Te chains) and a narrower one near 127cm\(^{-1} \) (group IV crosslinking units). The scattering strength of the 127cm\(^{-1} \) mode increases at the expense of the 160cm\(^{-1} \) mode as \( x \) increases. The nature of structure evolution with glass composition will be commented upon.

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